

Interactive comment on “Areal rainfall estimation using moving cars as rain gauges – a modelling study” by U. Haberlandt and M. Sester

Anonymous Referee #2

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General comments:

In general, the manuscript presents a very interesting and new approach using potentially available "GPS/car-data" to improve spatially distributed rainfall data. The paper is well written and organized and could be a valuable contribution to the research in the field of rainfall measurements. Therefore, I encourage the authors to continue this kind of research. However, even if the authors present an appealing modeling study the basic methodological assumptions underlying this modeling approach must be clarified before the manuscript could be published. Hence, I suggest major revisions including a re-review process.

(1) Before publishing the paper, at least some measured data regarding the relation-
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ship between rainfall and wiper frequency is needed. A lot of new cars still have staged windscreen wiper, so each stage must be used for a relatively wide range of rainfall intensities introducing a large uncertainty in the derived rainfall. Moreover, as stated by the authors the rainfall-wiper-speed-relation depends on wiper (car) type, wiper age, car speed, individual driver behavior, wind speed etc., which all introduce uncertainties in the potential rainfall data derived from a car network. As long as the authors cannot give any evaluation regarding all this uncertainty in the potential data the results presented here are based on weak ground.

(2) Even if some rainfall-wiper-speed-relation could be established a kind of uncertainty analysis due to the difficulties for a precise determination of rainfall with this technique would be necessary, to address the question if the presented approach leads to any improvement compared to existing measuring systems. This should include a discussion regarding spatially varying errors in measuring rainfall with the car network (e.g. due to different wind speeds along different streets etc.).

(3) To use rainfall radar data as true, e.g. for further calibration, seems to be difficult due to the large error in the derived rainfall products.

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